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CHILTON'S

March 1, 1985

MANUFACTURING MANAGEMENT

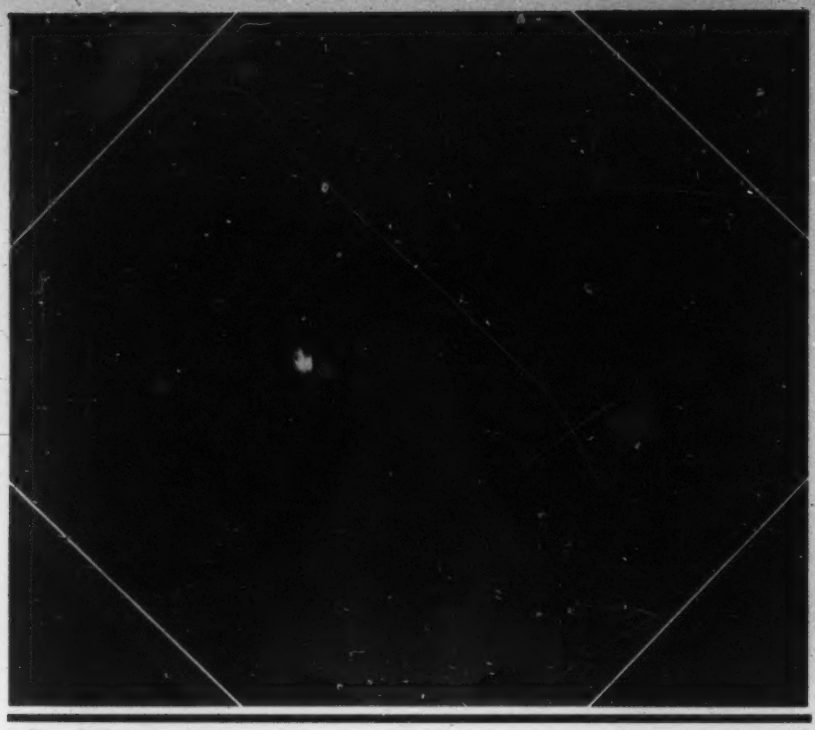
HARD CHOICES IN PLANT CONTROLS – A LOOK AT THE FIELD

ROCKWELL MOVES IN ON ALLEN-BRADLEY

MATERIALS 2000: CAD CAM AND ADVANCED MATERIALS DESIGN

MARCH 1, 1985 VOL. 228, NO. 5

CHILTON'S
IRON AGE
MANUFACTURING MANAGEMENT



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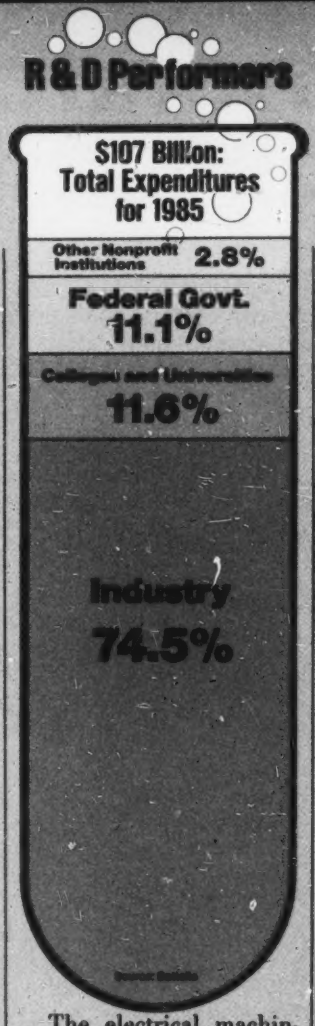
The nation's R&D budget is expected to go up again in 1985

Expenditures for research and development in the U.S. are expected to reach $107.3 billion in 1985, an increase of 3.9 pct over 1984. According to the annual forecast of Battelle Memorial Institute's Columbus Division, this is slightly better than the 10-year average rate of 4.2 pct in real R&D effort that has been experienced since 1974.

Industrial funding for R&D, projected to increase more significantly than government support, will account for 51.3 pct of the total funding. Industrial support is forecast to be $55 billion, up 11.4 pct from 1984. Battelle sees an increase of 10 pct in Federal support for R&D, with funding expected to be $48.7 billion.

The Battelle forecast noted that industry will remain the dominant performer of R&D. In 1985, performance of R&D by industry is expected to rise to almost $80 billion, or 74.5 pct of all research performed. This compares with $11.9 billion (11.1 pct) for the Federal government and $12.5 billion (11.6 pct) for academic institutions.

As part of the forecast, Battelle estimated the industrial vs Federal financial support for R&D performed by several broad industrial sectors. In 1985, Battelle expects the aerospace industry to retain leadership in total R&D, with funding of about $20 billion. Of that, 75 pct will be funded by the Federal government.



The electrical machinery and communications industry is forecast to have the second largest total R&D support with almost $17 billion. Of that, two-thirds will be industrially funded.

Estimates for total R&D funds in other industries include $9.7 billion for machinery, $7.2 billion for automotive, $821 million for fabricated metals and ordnance, $497 million for iron and steel, and $407 million for nonferrous metals. In these areas, the money is provided mainly by industry.

Production and orders on the upswing, purchasers say

Purchasing managers for leading manufacturing corporations said the business tempo picked up in January, ending the downward drift during the latter months of 1984.

The National Association of Purchasing Management (NAPM) said an abrupt upward shift in production and new orders prompted some widening in commitments for production goods, although there still was a tendency to hold inventory down.

Some 25 pct of members reporting said new orders were up in January. This compares with 19 pct for December and broke a six-month decline. Declines in new orders in January were reported by 20 pct, compared with 24 pct the previous month.

Increased production in January was reported by 27 pct of those polled, while only 12 pct said output was down. This compares with 17 pct reporting higher production and 22 pct reporting lower production for December.

More members reported lower inventories than reported increases during January—19 pct to 28 pct—but the field was much narrower than in December when 18 pct reported additions to stock and 32 pct said their inventories were cut.

Lead times on production materials of two months or more were reported by 46 pct compared with 45 pct for December, but this was well under the 51 pct making longer commitments last November.

NAPM said 39 pct of members polled reported that overall price hikes for the first quarter were lower than originally budgeted and only 5 pct said they were higher.

Aluminum and steel products were among industrial commodities reported down in price—particularly sheet steel—while the only items on the up side were titanium dioxide, caustic soda, sulfuric acid and tall oil. Fuel oil, gasoline, natural gas, coal, and some miscellaneous chemicals also were lower in price.

NAPM said attempts to raise prices on corrugated shipping containers apparently met resistance, as did many chemical products. Corrugated containers had been on NAPM's "up" list for six straight months until January.

Magnesium started the year with few price increases

Price hikes on magnesium were held to a few small volume alloys as 1985 got under way.

The price of primary magnesium, which over the past several years has been marked up in January more often than not, was held to $1.48 a lb, the level reached after two 5¢ a lb hikes in January and July 1984.

The price for the key die casting grade, AZ91B, also went unchanged at a range of $1.26 to $1.30 a lb. Dow Magnesium, which is at the high end of the range on the die casting alloy (but grants a 4¢ a lb discount), increased its posted prices for magnesium sticks by 5¢ to $2.02 a lb and its prices for AZ63A, AZ92A and AZ91C alloys by 5¢ to $1.48 a lb.

The McLean, Va.-based International Magnesium Association said magnesium production worldwide rose faster than shipments last year.

PRICE & PRODUCTION DATA

(Effective February 4, 1985)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
Northeast Coast	163	154	148	237
Pittsburgh	198	189	162	265
Youngstown	98	96	64	114
Lake Erie	156	120	123	146
Detroit	138	122	132	150
Chicago	447	392	393	565
Cincinnati	92	83	79	94
St. Louis	76	76	63	76
Southern	169	163	156	196
Western	76	63	71	81
U.S. Production	1,613	1,458	1,391	1,934

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural ..... gross-ton 80.50-86.9*
Mesabi, regular-unscreened ..... gross-ton $32.53
Mesabi, non-bessemer ..... gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1-27-81.
86.9¢—U.S. Steel as of 3-15-82, Cleveland-Cliffs as of 2-26-82, Oglebay Norton as of 3-25-82, and Hanna Mining as of 2-26-82.
**Effective 8-1-83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective February 4, 1985)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1985	To Date 1984
Net tons, in thousands	1,613	1,458	7,146	8,410
Capability Utilization Rate	62.3	56.6	58.5	68.3

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* 1¢/lb.—eff. 7-1-84)	27.582	27.582	27.582	26.822
Pig Iron** (Net ton = 2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.*** (Gross ton = 2240 lbs.)	$ 82.50	$ 81.50	$ 80.50	$ 95.17
No. 2 bundles	$ 54.50	$ 53.50	$ 52.17	$ 61.17

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh	$ 86.50	$ 83.50	$ 83.50	$103.50
No. 1 steel, Philadelphia	80.50	80.50	77.50	91.50
No. 1 steel, Chicago	80.50	80.50	80.50	90.50
No. 1 bundles, Detroit	75.50	75.50	70.50	101.50
Low Phos., Youngstown	72.50	72.50	72.50	104.50
No. 1 mach'y cast., Pgh	71.50	66.50	66.50	79.50
No. 1 mach'y cast., Phila	98.50	98.50	98.50	100.50
No. 1 mach'y cast., Chi	111.50	111.50	111.50	111.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
**Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
***Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective February 4, 1985) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum (LME)	49.75	49.76	2/4/85
Copper (C)	67.00-68.00	67.00	1/31/85
Lead	20.00-21.00	18.00-21.00	1/22/85
Magnesium Ingot	148.00	143.00	5/25/84
Nickel (LME)	233.98	228.57	2/4/85
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	43.00	43.00-45.00	1/22/85

ALUMINUM: Avg. for last week & previous week. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig, delivered. NICKEL: Avg. for last week & previous week. Canada. ZINC: high-grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$230.00
Beryllium-copper, per lb. cont. Be	$140.00
Beryllium 97% powder 200	$178.00
Cadmium, ton lots	$1.25-1.55
Calcium, ton lots, crown	$3.76
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$301.25
Indium, dollars per troy oz.	$3.10-3.30
Iridium, dollars per troy oz.	$475.00
Magnesium sticks, 10,000 lbs.	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$313.00-321.00
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel electro (PDCR)	$3.29
Palladium, per troy oz.	$131.00
Platinum, per troy oz.	$283.00
Rhodium, per troy oz.	$1,030.00
Silver ingots, per troy oz.	$6.16
Vanadium	$6.00
Zirconium sponge	$12.00-17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb. EX SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Jan. 28—532.33 Jan. 31—530.35
Jan. 29—531.94 Feb. 1—Holiday
Jan. 30—531.27

Scrap Prices
Brass Mill Scrap

(Cents per lb. over 20,000 lbs. add 1¢ per lb.)

	Solids	Turnings
Copper	60 1/8	51 1/4
Yellow brass	54 1/4	50
Red brass	56 5/8	49 1/2
Comm. bronze	57 5/8	50
Mang. bronze	56 3/4	46 3/4
Free-cutting rod ends	51	50

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	57
No. 2 copper wire	49
Light copper	40

Ingot Makers Scrap

(Cents per lb.; carload lots, del. refinery)

No. 1 copper wire	53
No. 2 copper wire	45
Light copper	36
No. 1 composition	46
No. 1 comp. turnings	44
Hvy. yellow brass solids	34
Hvy. yellow brass turnings	32
Radiators	37

Aluminum

New mixed clips	35	— 36
Old sheet	33	— 34
Old cast	33	— 34
Clean dry borings	34	— 35

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	29	— 30
Mixed I.C. clips	27	— 28
Old sheets and cast	24	— 26
Borings and turnings	22	— 23
Duraluminum clippings	25	— 26

Copper and Brass

No. 1 copper wire	46	— 47
No. 2 copper wire	38	— 39
Light copper	33	— 34
Radiators	32	— 33
No. 1 composition	40	— 41
No. 1 composition turnings	37	— 38
Cocks and faucets	30	— 32
Clean heavy yellow brass	28	— 29
Brass Pipe	28	— 29
New soft brass clippings	41	— 42

Lead

Heavy soft lead	9	— 10
Whole batteries	1	— 3
Type metal	16	— 17
Electrotype	13	— 14

Nickel

Nickel solids	115	—120
Nickel rod ends	115	—120
Nickel sheets, clips	115	—120
Nickel turnings	40	— 45

Zinc

New zinc clippings	18	— 19
Old diecast zinc	14	— 15

EFFECTIVE FEBRUARY 4, 1985

(Effective February 4, 1985) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 86.00 to	$ 87.00
No. 2 hvy. melting	76.00 to	77.00
No. 1 dealer bundles	98.00 to	99.00
No. 1 factory bundles (auto)	96.00 to	97.00
No. 2 bundles	53.00 to	54.00
No. 1 busheling	98.00 to	99.00
Machine shop turnings	10.00 to	11.00
Shoveling turnings	51.00 to	52.00
Cast iron borings	49.00 to	50.00
Low phos. punchings plate	103.00 to	104.00
Heavy turnings	76.00 to	77.00
No. 1 RR hvy. melting	93.00 to	94.00
Rails, 2 ft. and under	112.00 to	113.00
Scrap rails, random lgth	94.00 to	95.00
RR specialties	102.00 to	103.00
No. 1 machinery cast	71.00 to	72.00
Cupola cast	64.00 to	65.00
Heavy breakable cast	30.00 to	31.00
Stainless		
18-8 bundles and solids	570.00 to	580.00
18-8 turnings	470.00 to	480.00

Chicago

No. 1 hvy. melting	$ 80.00 to	$ 81.00
No. 2 hvy. melting	75.00 to	76.00
No. 1 dealer bundles	97.00 to	98.00
No. 1 factory bundles (auto)	96.00 to	97.00
No. 2 dealer bundles	59.00 to	60.00
No. 1 busheling	95.00 to	97.00
Shredder scrap	94.00 to	95.00
Machine shop turnings	44.00 to	45.00
Mixed borings and turnings	45.00 to	46.00
Shoveling turnings	50.00 to	51.00
Cast iron borings	50.00 to	51.00
Low phos. forge crop	116.00 to	117.00
Low phos. punchings plate 1/4 in. and heavier	129.00 to	130.00
Low phos. 2 ft. and under	124.00 to	125.00
No. 1 RR hvy. melting	92.00 to	93.00
Scrap rails random lgth	92.00 to	93.00
Rerailer rails	107.00 to	108.00
Rails, 2 ft. and under	116.00 to	117.00
RR couplers and knuckles	99.00 to	100.00
RR car axles	123.00 to	124.00
No. 1 machinery cast	111.00 to	112.00
Cupola cast	99.00 to	100.00
Stove plate	97.00 to	98.00
Steel car wheels	102.00 to	103.00
Stainless		
18-8 bundles and solids	520.00 to	530.00
18-8 turnings	440.00 to	450.00
430 bundles and solids	135.00 to	140.00
430 turnings	105.00 to	110.00

Philadelphia

No. 1 hvy. melting	$ 79.00 to	$ 82.00
No. 2 hvy. melting	69.00 to	72.00
No. 1 dealer bundles	90.00 to	93.00
No. 2 dealer bundles	49.00 to	52.00
No. 1 busheling	90.00 to	93.00
Shredder scrap	100.00 to	103.00
Machine shop turnings	29.00 to	32.00
Mixed borings and turnings	29.00 to	32.00
Shoveling turnings	38.00 to	41.00
Low phos. 5 ft. and under	89.00 to	92.00
Low phos. 2 ft. punchings	110.00 to	113.00
Electric furnace bundles	104.00 to	107.00
RR specialties	89.00 to	92.00
Rails, 2 ft. and under	112.00 to	115.00
Cupola cast	80.00 to	83.00
Heavy breakable cast	57.00 to	60.00
No. 1 machinery cast	97.00 to	100.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 58.00 to	$ 59.00
No. 2 hvy. melting	57.00 to	58.00
No. 1 dealer bundles	75.00 to	76.00
No. 2 bundles	35.00 to	36.00
No. 1 busheling	74.00 to	75.00
Drop forge flashings	45.00 to	46.00
Machine shop turnings	48.00 to	49.00
Mixed borings and turnings	24.00 to	25.00
Shoveling turnings	49.00 to	50.00
Cast iron borings	31.00 to	32.00
Heavy breakable cast	40.00 to	41.00
Mixed cupola cast	56.00 to	57.00
Automobile cast	80.00 to	81.00
Stainless		
18-8 bundles and solids	465.00 to	475.00
18-8 turnings	370.00 to	380.00
430 bundles and solids	110.00 to	120.00

Youngstown

No. 1 hvy. melting	$ 69.00 to	$ 72.00
No. 2 hvy. melting	52.00 to	55.00
No. 1 dealer bundles	81.00 to	84.00
No. 2 dealer bundles	35.00 to	38.00
Machine shop turnings	11.00 to	14.00
Shoveling turnings	16.00 to	19.00
Low phos. plate	71.00 to	74.00
Electric furnace bundles	69.00 to	72.00
Galvanized bundles	59.00 to	62.00

Cleveland

No. 1 hvy. melting	$ 58.00 to	$ 61.00
No. 2 hvy. melting	34.00 to	37.00
No. 1 dealer bundles	73.00 to	76.00
No. 1 factory bundles	79.00 to	82.00
No. 2 bundles	22.00 to	25.00
No. 1 busheling	75.00 to	78.00
Machine shop turnings	6.00 to	9.00
Mixed borings and turnings	6.00 to	9.00
Shoveling turnings	7.00 to	10.00
Cast iron borings	10.00 to	13.00
Cut structural & plates, 2 ft. and under	105.00 to	108.00
Low phos. punchings plate	105.00 to	108.00
Drop forge flashings	40.00 to	43.00
Foundry steel, 2 ft. & under	57.00 to	60.00
No. 1 RR hvy. melting	73.00 to	76.00
Rails, 2 ft. and under	112.00 to	115.00
Rails, 18 in. and under	113.00 to	116.00
Steel axle turnings	58.00 to	59.00
Railroad cast	89.00 to	91.00
No. 1 machinery cast	99.00 to	101.00
Cupola cast	55.00 to	58.00
Stove plate	41.00 to	44.00
Stainless		
18-8 bundles	375.00 to	385.00
18-8 turnings	325.00 to	335.00
430 bundles	80.00 to	85.00

Buffalo

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 63.00 to	$ 64.00
No. 2 hvy. melting	52.00 to	53.00
No. 1 busheling	74.00 to	75.00
No. 1 dealer bundles	74.00 to	75.00
No. 2 bundles	37.00 to	38.00
Machine shop turnings	16.00 to	17.00
Mixed boring and turnings	17.00 to	18.00
Shoveling turnings	27.00 to	28.00
Cast iron borings	24.00 to	25.00
Low phos. plate	97.00 to	98.00
Structural and plate, 2 ft. and under	100.00 to	101.00
Rails, 2 ft. and under	100.00 to	101.00
Scrap rails, random lgth	74.00 to	75.00
No. 1 machinery cast	80.00 to	81.00
No. 1 cupola cast	60.00 to	61.00

St. Louis

No. 1 hvy. melting	$ 64.00 to	$ 65.00
No. 2 hvy. melting	53.00 to	54.00
Foundry steel, 2 ft.	61.00 to	62.00
No. 1 dealer bundles	64.00 to	65.00
No. 2 bundles	48.00 to	49.00
Machine shop turnings	17.00 to	18.00
Shoveling turnings	23.00 to	24.00
Cast iron borings	27.00 to	28.00
No. 1 RR hvy. melting	64.00 to	65.00
Rails, random length	65.00 to	66.00
Rails, 18 in. and under	81.00 to	82.00
RR specialties	80.00 to	81.00
Cupola cast	74.00 to	75.00
Heavy breakable cast	52.00 to	53.00
Stove plate	89.00 to	90.00
Steel car wheels	97.00 to	98.00
Rerailing rails	78.00 to	79.00
Unstripped motor blocks	61.00 to	62.00

Birmingham

No. 1 hvy. melting	$ 73.00 to	$ 74.00
No. 2 hvy. melting	69.00 to	70.00
No. 1 dealer bundles	77.00 to	78.00
No. 2 bundles	50.00 to	51.00
No. 1 busheling	77.00 to	78.00
Shredder scrap	99.00 to	100.00
Machine shop turnings	29.00 to	30.00
Shoveling turnings	42.00 to	43.00
Cast iron borings	39.00 to	40.00
Electric furnace bundles	74.00 to	75.00
Elec. furnace, 3 ft. & under	74.00 to	75.00
Structural and plate, 2 ft.	100.00 to	101.00
Structural and plate, 4 ft.	92.00 to	93.00
No. 1 RR hvy. melting	92.00 to	93.00
Scrap rails, random lgth	90.00 to	91.00
Rails, 2 ft. and under	105.00 to	106.00
Angles and splice bars	92.00 to	93.00
No. 1 cupola cast	87.00 to	88.00
Unstripped motor blocks	75.00 to	76.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 52.00 to	$ 53.00
No. 2 hvy. melting	51.00 to	52.00
No. 1 dealer bundles	63.00 to	64.00
No. 2 bundles	25.00 to	26.00
Machine shop turnings	4.00 to	5.00
Shoveling turnings	6.00 to	7.00
Cast iron borings	17.00 to	18.00
Low phos. 18 in. and under	84.00 to	85.00
Rails, random length	65.00 to	66.00
Rails, 2 ft. and under	78.00 to	79.00
No. 1 cupola cast	58.00 to	59.00
Heavy breakable cast	25.00 to	26.00
Drop broken cast	75.00 to	76.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 47.00 to	$ 48.00
No. 2 hvy. melting	38.00 to	39.00
No. 2 dealer bundles	23.00 to	27.00
Mixed borings and turnings	11.00 to	13.00
Machine shop turnings	6.00 to	7.00
Shoveling turnings	14.00 to	15.00
Clean cast, chem. borings	35.00 to	36.00
No. 1 machinery cast	89.00 to	90.00
Mixed yard cast	50.00 to	51.00
Heavy breakable cast	10.00 to	12.00
Stainless		
18-8 prepared solids	495.00 to	515.00
18-8 turnings	395.00 to	415.00
430 prepared solids	90.00 to	110.00
410 solids	80.00 to	90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 58.00 to	$ 60.00
No. 2 hvy. melting	48.00 to	50.00
No. 1 dealer bundles	58.00 to	60.00
No. 2 bundles	35.00 to	37.00
No. 1 busheling	65.00 to	67.00
Shredder scrap	65.00 to	67.00
Machine shop turnings	10.00 to	12.00
Shoveling turnings	18.00 to	20.00
No. 1 machinery cast	81.00 to	86.00
Mixed cupola cast	48.00 to	50.00
Heavy breakable cast	8.00 to	10.00

San Francisco

No. 1 hvy. melting	$ 44.00 to	$ 46.00
No. 2 hvy. melting	38.00 to	40.00
No. 1 dealer bundles	35.00 to	37.00
No. 2 dealer bundles	20.00 to	22.00
Machine shop turnings	8.00 to	9.00
Cast iron borings	8.00 to	9.00
No. 1 cupola cast	81.00 to	83.00

Los Angeles

No. 1 hvy. melting	$ 47.00 to	$ 49.00
No. 2 hvy. melting	40.00 to	42.00
No. 1 dealer bundles	38.00 to	40.00
No. 2 dealer bundles	20.00 to	22.00
Machine shop turnings	13.00 to	14.00
Shoveling turnings	10.00 to	11.00
Cast iron borings	8.00 to	9.00
Elec. furnace, 1 ft. and under (foundry)	74.00 to	76.00
No. 1 cupola cast	75.00 to	77.00

Seattle

No. 1 hvy. melting	66.00 to	68.00
No. 2 hvy. melting	57.00 to	59.00
No. 2 bundles	40.00 to	42.00
No. 1 cupola cast	92.00 to	93.00
Mixed yard cast	82.00 to	84.00

Hamilton, Ont.

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 86.00
No. 2 hvy. melting, cut 2 ft. and under	78.00
No. 1 dealer bundles	84.00
No. 2 bundles	60.00
Mixed steel scrap	57.00
Bush. new tact. prep'd	86.00
Bush. new tact. unprp'd	75.00
Machine shop turnings	31.00
Short steel turnings	33.00
Mixed borings and turnings	25.00
Cast scrap	85.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 74.00 to	$ 75.00
No. 2 hvy. melting	61.00 to	62.00
No. 2 bundles	46.00 to	47.00
Machine shop turnings	14.00 to	15.00
Crushed turnings	31.00 to	33.00
Shredder scrap	78.00 to	79.00
Cut structural plate, 2 ft. and under	105.00 to	106.00
Cut structural plate, 5 ft. and under	89.00 to	90.00
Unstripped motor blocks	60.00 to	61.00
Cupola cast	82.00 to	83.00

PRODUCER KEY
With Principal Offices

A7 Armco Inc., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A11 Atlantic Wire Co., Branford, Conn.

B1 Baron Drawn Steel Corp., Toledo, Ohio
B3 Bethlehem Steel Corp., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin Steel Co., Harvey, Ill.

C6 CF&I Steel Corp., Pueblo, Colo.
C10 Copperweld Steel Co., Warren, Ohio
C16 Connors Steel Co., Birmingham, Ala.
C20 Calumet Steel Div., Chicago Heights, Ill.

D1 Detroit Strip Div., Cyclops Corp.

E4 Eliot Bros. Steel Co., New Castle, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Division, National Steel Corp., Ecorse, Mich.
G4 Greer Steel Co., Dover, Ohio
G5 Green River Steel Corp., Owensboro, Ky.
G6 Gibraltar Steel Corp., Buffalo, N. Y.
G7 Georgetown Steel Corp., Georgetown, S.C.

H1 Hercules Drawn Steel Corp., Livonia, Mich.

I2 Ingersoll Steel Div., Newcastle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Steel Corp., Chicago

J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K2 Keystone Consolidated Industries, Inc.
K3 Kentucky Electric Steel Co., Ashland, Ky.
K5 Kemco Div., Foote Mineral Co., Keokuk, Ia.

L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.
L5 Litho-Strip Corp., Chicago

M2 McLouth Steel Products Corp., Detroit
M8 Mill Strip Products Div., National Steel Service Center, National Steel Corp.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M11 Midwest Steel Div., National Steel Corp., Portage, Ind.

N1 Northeast Precision Steel Co., Boston
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N9 Nelsen Steel & Wire Co., Chicago, Ill.
N10 North Star Steel Co., Saint Paul, Minn.

O2 Oregon Steel Mills, Portland, Ore.

P2 Phoenix Steel Corp., Claymont, Del.
P15 Philadelphia Steel and Wire Corp., Phila.

R3 Republic Steel Corp., Cleveland
R4 Ramco Steel Co., Buffalo, N. Y.
R5 Roblin Steel Corp., North Tonawanda, N.Y.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S10 Seneca Steel Service, Buffalo, N. Y.
S16 Southern Precision Steel Co., Gulfport, Miss.

T4 Thomas Steel Strip Co., Warren, Ohio
T5 Timken Co., Steel Division, Canton, Ohio
T7 Texas Steel Co., Fort Worth, Tex.
T9 Triumph Electro Corp., Chicago, Ill.
T10 Tennessee Forging Steel Corp., Harriman, Tenn.
T11 Teledyne Columbia-Summerill, Carnegie, Pa.

U1 United States Steel Corp., Pittsburgh, Pa.

W3 Weirton Steel Corp., Weirton, West Va.
W5 Wheeling-Pittsbugh Steel Corp.
W7 Wilson Steel & Wire Co., Chicago
W10 Wyckoff Steel Div., Ampco-Pittsbugh Corp., Pittsbugh
W14 Whittaker Steel Strip Div., Detroit Mich.

STEEL SERVICE CENTER PRICES — Price, Dollars per 100 lb

Prices are based on list prices reported to *Iron Age* by a number of metal service centers deemed representative by *Iron Age* and then weighted based in part on the report received each month. Prices are not intended to reflect the actual transaction prices obtained by any individual metal service center.

Cities* / City Delivery Charge	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
	Hot Rolled (10 gage)	Cold Rolled (20 gage)	Galvanized (16 gage)	Hot Rolled Strip	Plates	Standard Structurals	Hot Rolled (merchant)	Cold Finished	Hot-Rolled 8620 As Rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 8620 As Rolled	Cold-Drawn 4140 Annealed
Atlanta	26.95	31.73	34.11	31.63	25.27	22.55	19.84	31.25	34.34	50.60	69.58	73.19
Baltimore	26.90	30.72	35.71	36.82	32.66	28.80	22.60	36.40	51.69	56.95	63.60	69.98
Birmingham	25.58	31.73	34.35	31.26	25.40	22.42	20.28	31.30	49.31	58.90	68.10	74.43
Boston	34.94	40.19	45.64	47.54	33.25	30.06	23.88	40.29	47.92	51.02	58.48	63.50
Buffalo	31.10	35.68	41.89	40.15	30.60	26.15	20.15	36.70	44.15	47.85	53.92	59.84
Chicago	28.46	34.62	37.60	32.74	22.40	21.18	17.99	28.87	37.31	41.09	46.52	52.75
Cincinnati	29.60	34.58	37.16	30.85	23.14	20.75	18.25	31.88	37.16	42.54	46.63	52.44
Cleveland	28.48	34.22	37.48	36.74	23.60	23.58	18.89	34.02	38.19	44.50	47.48	53.93
Denver	31.44	38.19	36.22	37.09	27.40	24.56	20.39	39.80	50.55	57.95	65.95	70.19
Detroit	29.21	35.20	37.87	31.39	23.13	22.24	17.25	32.00	37.18	42.51	46.81	53.49
Houston	27.67	28.71	31.69	39.21	26.73	26.27	21.60	40.15	45.96	52.87	58.95	66.14
Kansas City	30.72	36.98	39.70	34.01	27.10	23.68	18.19	34.15	39.60	45.40	49.73	54.87
Los Angeles	27.01	31.33	37.84	34.31	28.39	32.31	26.81	38.05	50.88	57.10	63.15	70.64
Memphis	26.37	32.51	35.34	33.57	27.75	26.63	21.69	33.87	36.78	49.96	59.80	69.44
Milwaukee	28.76	34.19	36.99	33.06	23.79	23.54	17.87	29.01	36.58	41.65	45.66	52.60
New York	32.47	38.99	42.55	43.38	32.66	25.31	21.35	40.05	40.90	46.40	51.84	55.34
Philadelphia	28.10	38.99	41.23	43.50	31.05	27.15	19.28	36.44	45.80	50.25	60.22	65.42
Pittsburgh	35.27	40.97	45.23	43.45	37.60	30.44	21.58	30.44	38.43	44.64	49.90	54.10
Portland	28.96	32.08	38.73	36.93	32.88	34.78	27.16	44.85	49.78	57.74	70.44	.....
San Francisco	26.94	31.55	37.04	34.48	27.78	30.19	26.07	38.70	50.70	57.69	63.90	70.05
Seattle	23.61	30.12	36.65	32.95	22.02	27.32	26.05	39.14	53.03	61.70	69.75	74.63
Spokane	21.21	30.42	35.65	38.02	35.00	33.77	22.26	43.01	43.20	47.52	.....	58.32
St. Louis	29.11	34.60	37.31	34.59	23.89	21.73	18.44	32.28	38.12	43.51	47.85	53.69
St. Paul	28.87	33.61	35.61	38.36	23.81	22.48	17.99	32.48	37.52	42.72	47.09	53.31

Base Quantities. All HR products may be combined for quantity. Hot-rolled sheet, 10 ga x 36 x 96—120; Cold-rolled sheet, 20 ga x 36 x 120; Galv. sheet—16 ga x 36—120; Hot-rolled strip—1.8" x 1"; Plate 1.4" x 84". Shapes—I Beams 6 x 12.5; Hot-rolled bar—Rounds 3.4-2.15.16; Cold finished bar—C 1018—1" rounds; Alloy bar—Hot-rolled 8620—1.5.8" round; Cold drawn—1" round; Hot-rolled 4140—1.5.8" round; Cold drawn—1" round. Check local supplier for additions or deductions from base.

*Prices at all points include metropolitan delivery charges.

Codes identify Producers listed on p. 78. (Prices quoted are mill base prices in cents per pound unless otherwise noted and do not reflect extras or surcharges.)
N.A. = Not available.

Billets, Blooms, Slabs

(Dollars per net ton)

Carbon Rerolling, Midwest	
W5	$366.00
N4	$366.00
West	
C6	$346.00
Carbon Forging, East	
B3(2), C10, U1	$473.00
R3	$453.00
Midwest	
R3, W5	$453.00
S1, U1, I3	$473.00
C10	$473.00
K2	$473.00
West	
B3(2)	$463.00
C6	$453.00
Alloy, East	
R3	$492.00
B3, U1, C10	$512.00
Midwest	
W5	$492.00
U1, C10, I3	$512.00
R3	$492.00
S1	$512.00
West	
B3	$502.00
C6	$469.00

Piling Sheet Steel

(cents per lb)

Midwest	
U1	$ 26.45

Structurals

Carbon, East	
B3	22.90
U1, J3	23.90
Midwest	
C20	22.90
W8	22.90
I3, T10, U1, N4	23.90
West	
C6	25.10
B3(2)	21.65
South	
C16, U1	23.90
T10	22.90
A8	Cmp.
High-Strength, Low Alloy, East	
B3	22.90
U1, J3	23.90
Midwest	
N4	23.90
W8	24.15
U1	23.90
I3	23.90
West	
B3	21.65
South	
U1, C16	23.90
Wide Flange, Carbon, East	
B3	22.90
U1, J3	23.90
Midwest	
U1	23.90
N4	23.90
I3	23.90
West	
C6	24.15

Strip

Hot-Rolled, Carbon, Cut II Edge—all widths, East	
U1, B3	23.75
J3	22.05
Midwest	
D1	22.05
I4	22.85
J3, W3	22.05
G2, G3	23.45
N4	22.55
W5, S1, A7	23.75
U1, B3, I3	23.75
M2, R3	22.05
West	
B3	26.55
South	
R3	22.05
Cold-Rolled, Carbon Max. 25%, East	
E4	29.75
S10	29.60
P15	24.80
B4	36.60
G6	36.175
Midwest	
I4	38.30
W14	32.80
J4	34.05
S1	37.05
High-Strength, Hot-Rolled, Low Alloy, Cut Edge & Mill Edge—all widths, (plus extras)*	
Midwest	
M2, R3, W3, J3, I3	22.05
G2, G3	23.45
S1	23.75
A7	25.35
South	
R3	22.05
High-Strength, Cold-Rolled, Low Alloy, Mill Edge	
Midwest	
S1	37.05
Alloy, Hot-Rolled, Midwest (plus extras)*	
S1	26.10
I4	25.20
Alloy, Cold-Rolled, East (plus extras)*	
E4,M8	43.35
B4	47.25
P15	32.10
Midwest	
I4	44.30
S1	44.80

Sheets

Hot-Rolled, Carbon (18 Ga & Hvyr), East	
B3	23.75
J3	22.05
U1	23.75
Midwest	
M2, R3, W3	22.05
D1, J3	22.05
G2, G3	23.45
I4	22.45
U1, W5, S1, B3, I3, A7	23.75
West	
U1	24.25
South	
R3	22.05
Cold-Rolled, East, Class I	
B3(2)	28.15
J3	26.15
U1	28.15
Midwest	
R3, M2, W3	26.15
G2, G3, M11	27.85
I4	22.00
J3	26.15
D1	26.15
U1, W5, S1, B3, I3, A7	28.15
West	
U1	28.65
South	
R3	24.65
Galvanized (hot-dipped), East	
B3(2)	30.30
U1	30.30
Midwest	
J3, D1, W3	28.00
R3, Y1	28.00
G2, M11	30.00
U1, W5, S1, I3, A7	30.30
West	
U1	30.80
South	
R3	28.00
Enameling, Midwest	
U1, S1, I3, A7	29.65
J3	27.65
Long Terne, Midwest	
W5, A7	31.65
U1	31.65
R3	29.35

Wire Rod

East	
B3(2)	22.35
Midwest	
N4, K2	22.35
U1	24.10
A7	22.00
West	
C6	21.45
South	
G7	22.35

Tinplate

Electrolytic Tinplate

Single Reduced (70 lb)	
East	**per base box**
J3	26.29
U1	27.74
B3	27.54
Midwest	
U1	27.74
J3	26.29
M11	27.24
W3	26.29
W5	27.74
West	
U1	28.24
South	
U1	27.74
Double Reduced (55 lb)**	
Midwest	
M11	21.87
J3	21.49
U1	22.37
W3	21.49
W5	22.37
West	
U1	22.87
South	
U1	22.37
Black Plate	
Single Reduced (75 lb)*	
East	
B3	24.31
Midwest	
J3	24.01
I3, W5	24.57
W3	24.01
U1, M11	25.26
West	
U1	25.26
Double Reduced (55 lb)	
East	
B3	20.49
Midwest	
M11	19.70
W5	19.70
J3	18.93
W3	18.93
U1	19.70
West	
U1	19.70
South	
U1	19.70

*70 lb—base weight extra 45¢
**50 lb—base weight extra 1.40

Bars

Carbon Steel, Hot Rolled (Special quality)

East	
R3, K3	25.80
R5	25.80
J3	25.80
U1, C10, B3(3)	27.05
Midwest	
I4	23.95
U1, I3	27.05
R3, T10, C20, N4	25.80
K2	25.80
I3	22.00
A7	20.25
West	
B3	25.80
C6	24.45
South	
A8	20.65
C16	25.80
Cold-Finished Carbon, East	
A11	22.15
R3	33.75
T11, S8	31.00
J3(4), L2	31.00
M8, W10	31.00
N1	24.475
R4	33.25
B4	33.25
C10	31.00
Midwest	
W10, R3, M9	33.25
J3	31.00
B1	33.45
L2	30.75
N9	31.00
W14	22.20
B5	34.75
West	
R3	37.15
South	
J3	34.00
C16	24.40
J3	31.95
Alloy, Hot-Rolled, East	
R5, K3	27.95
R3, J3	27.95
U1, B3(2), C10	29.20
Midwest	
R3	27.95
I3, C10, U1	29.20
I4	26.10
I3	23.50
A7	20.25
West	
B3	27.95
C6	26.60
South	
A8	22.00
Alloy, Hot-Rolled, East	
L2	35.20
R3, N1	37.90
R4	37.10
AF11	30.50
J3, W10, L2	34.85
T11, S8	34.85
C10	34.85
Midwest	
R3	37.35
J3, W10, C10	34.85
B1	37.30
N9	34.85
L2	34.85
B5	38.60
M9	37.10
West	
R3	40.75
South	
J3	35.85
C16	28.00

Plates

Carbon Steel, East	
B3	23.25
L4, U1	25.75
P2	23.25
J3	26.75
Midwest	
B3	23.25
I3	25.75
J3, A7	22.80
U1, I4, S1	25.75
R3	26.75
West	
C6	24.25
U1, B3	25.75
O2	23.00
South	
R3	25.75
U1	25.75
Alloy East	
B3	31.05
U1, L4	33.55
P2	33.55
J3	34.55
Midwest	
B3	31.05
G2, G3	33.55
I4, U1	33.55
West	
B3	33.55
O2	31.00
South	
U1	33.55

Wire

Carbon Steel Wire, East	
B3	27.10
A11	22.15
Midwest	
R3	24.60
N4, W7	27.40
K2	24.20
South	
A8	22.85
West	
C6	24.95

ORDERS ENDED THE YEAR ON THE DECLINE

New orders for manufactured goods hit the skids again in December. Orders had rebounded in November following three previous months of declines.

Analysts attribute much of the decline to a drop in military orders following an exceptionally large increase—100 pct—in November.

For all of 1984 new orders were up a healthy 10.5 pct, peaking at close to $2.3 trillion. The 1984 increase reflects the overall strength of the economy during 1984.

In addition, durable goods industries' shipments in December were up 4.7 pct led by electrical machinery and transportation equipment. However, shipments of primary metals and nonelectrical machinery were down in December.

Overall new orders for manufactured goods dropped 0.7 pct in December compared with November to $193.5 billion, the Commerce Department said. The figures indicate that while consumers are willing to spend, business investment plans are still somewhat uncertain. One of the results of that was durable goods industries' inventories rose slightly—0.4 pct—marking 11 months out of the twelve that they were up.

December new orders for durable goods dropped 2.9 pct to $101.0 billion compared with $104.0 billion in November.

For the year, gains and declines balanced at six months each.

Capital goods orders in both nondefense and defense industries dropped in December. The former category—a key indicator of business investment plans—was down 6.3 pct to $25.5 billion.

Of the 24 categories shown, 11 were down, eight were up and 5 were unchanged. In the two shipments categories, motor vehicles and parts and farm machinery and equipment were unchanged.

Billions of Dollars, Seasonally adjusted Monthly Total, unless otherwise noted Source: U.S. Dept of Commerce		Latest Month or Qtr.	Previous Month or Qtr.	Same Period Year Ago
CAPITAL EXPENDITURES (Annual Rates)				
U.S. Industry, Total	4th Qtr.	$321.4*	$316.2	$321.6
Manufacturing, Total	4th Qtr.	139.1*	135.5	114.9
Manufacturing, Durable Goods	4th Qtr.	67.5*	64.8	53.5
Mining Industry	4th Qtr.	12.9*	13.2	13.1
KEY INDICATORS, Durable Goods Manufacturing				
New Orders	Dec.	101.0	104.0	96.7
Shipments	Dec.	101.8	101.7	96.0
Inventories	Dec.	191.2	190.4	171.2
Unfilled Orders	Dec.	345.9	346.7	322.2
NEW ORDERS, METALWORKING				
Capital Goods Producers, Nondefense Industries	Dec.	25.5	27.1	25.1
Capital Goods Producers, Defense Industries	Dec.	8.6	10.3	7.7
Primary Metals, Total	Dec.	10.3	10.8	10.3
Steel (SIC 331)	Dec.	4.7	4.7	3.7
Iron & Steel Castings (SIC 332)	Dec.	1.1	1.1	1.2
Nonferrous Metals	Dec.	4.5	5.0	5.4
Nonelectrical Mach.-Equip. Industries, Total	Dec.	16.1	18.1	16.8
Engines & Turbines	Dec.	1.6	1.3	1.2
Farm Machinery & Equipment (Shipments)	Dec.	0.8	0.8	1.2
Construction, Mining & Mat. Hdlg. Equip	Dec.	2.7	2.7	2.8
General Industrial Machinery	Dec.	1.2	1.5	1.4
Fluid Power Equipment** (Index-1972=100)	Dec.	231	269	248
Metalworking Machinery	Dec.	1.3	0.9	0.5
Machine Tools, Total ($Mill., Unadjusted)***	Dec.	252.2	212.0	151.1
Machine Tools, Metalcutting***	Dec.	156.2	160.0	91.1
Machine Tools, Metalforming***	Dec.	96.0	52.0	60.0
Electrical Mach. & Equip. Industries, Total	Dec.	15.4	14.5	16.0
Elec. Transmission Equip. & Ind. Apparatus	Dec.	2.2	2.0	2.0
Household Appliances	Dec.	1.4	1.4	1.5
Communication Equipment	Dec.	5.7	5.0	5.5
Transportation Equip. Industrial, Total	Dec.	26.6	28.6	24.3
Motor Vehicles & Parts (Shipments)	Dec.	16.9	16.7	15.2
Aircraft, Missiles & Parts	Dec.	8.3	10.2	7.6
Shipbuilding & Military Tanks	Dec.	0.6	1.2	0.2
Fabricated Metal Products, Total	Dec.	12.9	12.4	10.7
Instruments, Total	Dec.	4.8	4.8	4.6

*Est.—Commerce Dept; **Source: National Fluid Power Assn.; ***Source: NMTBA